

EJC

Notice of Allowability	Application No.	Applicant(s)	
	10/757,051	SCHOEN ET AL.	
	Examiner	Art Unit	
	Tiffany A. Fetzner	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/20/2005.
2. ☒ The allowed claim(s) is/are 21-38.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>12/20/2005</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Examiner's Comment

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. The drawings filed 01/14/2004 which now are part of applicant's instant application's official file record resolve the drawing concerns of the April 6th 2005 Office action. The examiner notes that prior to official entry only the drawings from the original parent application were viewable to the examiner. Currently there are no examiner objections to the drawings filed January 14th 2004.

4. The Examiner and the Official drafts person have approved the drawings filed January 14th 2004. [See the attached PTO 948 form.]

Response to Arguments

5. Applicant's arguments filed 12/20/2005 have been fully considered and they are persuasive.

6. In response to the applicant's amendments to the claims as set forth on pages 2 through 7 of the December 20th 2005 amendment, and the arguments presented on pages 9 paragraph 2 through page 15 paragraph 2 the rejections of the last office action are rescinded, and the application is now considered to be in condition for allowance by the examiner. The examiner notes applicant has misidentified claim 21 as claim 1 within the last paragraph of the remarks on page 12 of the December 20th 2005 amendment and response. Since there is no claim 1 in the instant application the examiner is

Art Unit: 2859

assuming that applicant meant to reference claim 21 and just made a typographical error.

7. The following is an examiner's statement of **Reasons for allowance**:

8. With respect to **independent claim 21** from the December 20th 2005 amendment and response, this claim is considered to be allowable by the examiner because the prior art of record does not teach or show:

Claim 21 ---A method of petrophysical evaluation of an earth formation using a logging tool conveyed in a borehole in said formation, the method comprising;

(a) obtaining a value of **a horizontal and a value of a vertical resistivity** of said earth formation using said logging tool; and

(b) determining a **horizontal and vertical permeability** of said formation using the obtained **horizontal resistivity** and the obtained **vertical resistivity** said **horizontal permeability** and said **vertical permeability** having a ratio different from a ratio of said **vertical resistivity** and said **horizontal resistivity**. ---

9. The prior art of record either obtains a **vertical resistivity** and a **horizontal resistivity**, with a **passing reference to the fact that many earth formations are permeable depending on bedding**, or the prior art of record uses a single resistivity log in order to determine the **horizontal permeability** and the **vertical permeability**.

10. The novelty of applicant's method is the ability to derive the **horizontal permeability** and the **vertical permeability** of the earth formation, from the **vertical resistivity** and the **horizontal resistivity** where the **horizontal permeability** and the **vertical permeability** have a **different ratio, from a ratio of the vertical resistivity** and the **horizontal resistivity**. To the best of the examiner's knowledge, applicant is the first to combine **horizontal permeability** and **vertical permeability, with vertical resistivity** and the **horizontal resistivity** in accordance with the method set forth in **amended independent claim 21** of the December 20th 2005 amendment and response.

Art Unit: 2859

11. With respect to **dependent claims 22-38** of the December 20th 2005 amendment and response, these claims are considered to be allowable by the examiner because they each depend from **allowable independent claim 21** as filed in the December 20th 2005 amendment and response.

12. With respect to **dependent Claims 24, 29, 31, 35, 36, and 38**. The **prior art of record** does not teach the combination of **claims 21, 23** with the combinational limitation including the step of "determining said horizontal and vertical permeabilities further comprises determining an estimate of bulk irreducible water content of the formation from NMR measurements" (i.e. **claim 24**), or the step of "using said volumetric model further comprises using at least one of: (i) the Thomas-Stieber model, and, (ii) the Waxman-Smits model" in combination with all of the other claim features of **claim 25** from which **claim 29** depends.

13. The **prior art of record** also does not teach the combination of **claim 31**, (i.e. "the method of **claim 26** wherein the at least one additional measurement comprises an NMR measurement, and deriving the parameter of interest further comprises deriving a distribution of relaxation times from said NMR measurements and obtaining therefrom a distribution of components of said anisotropic sand") in combination with all of the other claim features of **claim 26** from which **claim 31** depends. Additionally, the **prior art of record** also does not teach the combination of **claim 35**, (i.e. "determining horizontal, vertical and bulk permeability values further comprises using a relationship of the form $K = C\phi^a T^b$ where **K** is a permeability, ϕ is a porosity and **T** is a NMR relaxation time, and **a**, **b**, and **C** are fitting parameters"), in combination with all of the other claim features of **claims 32, 26, and 21** from which **claim 29** depends; or **claim 36**, (i.e., the method of **claim 35** wherein **T** is a longitudinal NMR relaxation time) which necessarily depends from **claim 35** and requires the NMR measurement in combination with each of the other features of **claims 35, 32, 26, and 21** from which **claim 36** depends.

14. Lastly, with respect to **Claim 38**, the **prior art of record** also does not teach the combination of **claim 38**, (i.e. that "the determined bulk permeability is a spherical permeability related to the horizontal and vertical permeability values by a relationship of the form $K_{sph} = [(K_h^2 K_v)^{1/3}]$."

Art Unit: 2859

15. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Prior Art of Record

16. The **prior art made of record** and not relied upon is considered pertinent to applicant's disclosure.

A) **Day et al.**, US patent 6,255,819 B1 issued July 3rd 2001, filed October 25th 1999.

B) **Tutunji et al.**, US patent 6,337,568 B1 issued January 2002, filed April 7th 2000, the **Tutunji et al.**, patent is a continuation in part of **Day et al.**, US patent 6,255,819 B1.

C) **Freedman et al.**, US patent 6,032,101 issued February 29th 2000.

D) **Schoen et al.**, US patent 6,686,736 B2 issued Feb. 3rd 2004 which is the issued patent of applicant's parent application, and therefore not available as prior art against the claims of the instant application.

E) **Schoen et al.**, US patent application publication 2001/0101235 A1 published August 1st 2002 which corresponds to the originally filed US application which became US patent 6,686,736 B2 issued Feb. 3rd 2004, the issued patent of applicant's parent application, that is not available as prior art against the claims of the instant application.

F) **Schoen et al.**, US patent application publication 2004/0140801 A1 published July 22nd 2004, which corresponds to applicant's instant application, and is therefore not available as prior art against the claims of the instant application.

G) **Vinegar et al.**, US patent 4,719,423 issued January 12th 1988

H) **Runge** US patent 3,479,581 issued November 18th 1969.

I) ***Dussan V. et al.**, US patent 5,463,549 issued October 31st 1995.

J) ***Hagiwara** US patent 5,966,013 issued October 12th 1999; filed June 12th 1996.

K) ***Klein et al.**, article "The Petrophysics of Electrically Anisotropic Reservoirs; by J.D. Klein, P.R. Martin, and D.F. Alen; from The Log Analyst, May-June 1997, pages 25-36.

Art Unit: 2859

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

18. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is (571) 273-8300.



TAF
February 6, 2006



Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800